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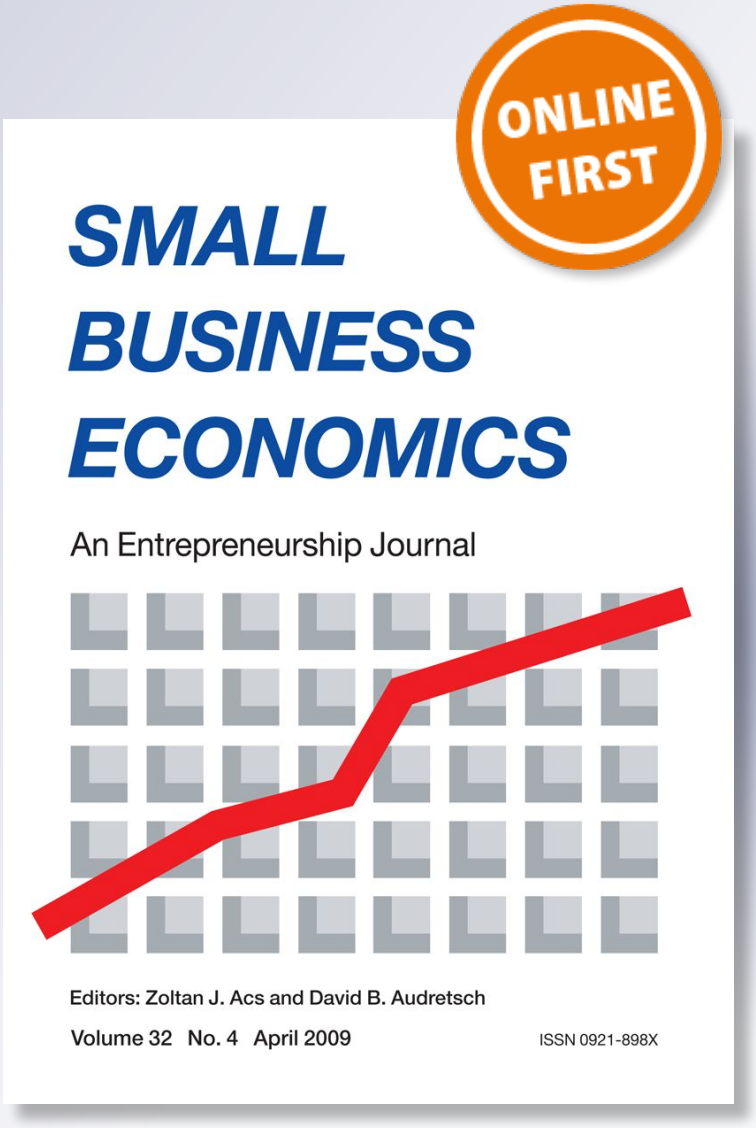

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Toward a theory of affordable loss

Richard A. Martina

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Abstract Although dozens of empirical studies have been published on effectuation as a whole, much work remains to be done on elaborating each principle in more depth. Based on an exploratory study of seven ventures from the Caribbean island of Curacao, this paper develops an elaborated process model of the affordable loss heuristic in effectuation. The model breaks affordable loss into two components—ability and willingness, and connects these to the concept of loss aversion from prospect theory. Furthermore, these components are encapsulated in a process involving identity, affect, and resourcefulness leading to the entry-stage entrepreneurial investment decision.

Keywords Affordable loss · Effectuation · Entrepreneurial entry · Heuristic · Investment

JEL classification D03 · D81 · L26

1 Introduction

The affordable loss (AL) heuristic (Sarasvathy 2001; Sarasvathy 2008) has been introduced as a response to the weaknesses of investment models based on expected return to explain entrepreneurial investments under Knightian uncertainty (Dew et al. 2009b). AL is one of the five principles of effectuation and is defined as what entrepreneurs can afford and what they are willing to lose in entrepreneurial investments (Dew et al. 2009b).

Research on AL has increased since its introduction by Sarasvathy in 2001. A literature review shows that scholars have predominantly treated AL as a subconstruct of effectual decision-making (e.g., Alsos et al. 2016; Berends et al. 2014; Guo et al. 2016). Empirical studies have shown that AL is, among others, positively related to R&D efficiency in projects with high innovativeness (Brettel et al. 2012); mediates the relationship between innovation orientation and firm performance; and is also positively related to venture performance (Cai et al. 2016). An earlier meta-analysis review of research in entrepreneurship before the introduction of effectuation, Read et al. 2009 found no specific relationship between AL and higher new venture performance. This was primarily because prior entrepreneurship research had no clear measures of AL. However, recent works point to the entrepreneurial investment decision being complex and containing multiple components (McCann and Folta 2012). Hence, there is a need for a deeper conceptual development of AL (Chandler et al. 2011; Werhahn et al. 2015).

Only a few authors, namely, Sarasvathy (2015) and Dew et al. (2009b), have made an attempt to delineate the mechanisms of AL. Sarasvathy puts forward two components to AL: the ability to invest and the willingness that determines the level of the investment. Dew et al. (2009b) suggest that the sources of financial payoffs that are weakly associated with payments (e.g.,

R. A. Martina (✉)
Centre for Applied Research on Economics and Management, Amsterdam University of Applied Sciences, Wibautstraat 3b, 1091 GH Amsterdam, Netherlands
e-mail: r.a.martina@hva.nl

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credit cards) positively affect the level of AL. However, the question "How do the entrepreneurs' abilities and willingness independently or jointly influence the process of entrepreneurial investing?" is still unanswered.

In this study, I use exploratory data from case studies and build on Sarasvathy (2015) and Dew et al. (2009b) to develop a process model of AL. A process model is "a general sequence of events that leads to a particular outcome an author is seeking to explain" (Cornelissen 2017, p. 5). I embed the process model of AL into (1) psychological theories of decision-making under uncertainty—that is, affect (Loewenstein et al. 2001; Slovic et al. 2004) and loss aversion (Kahneman and Tversky 1979), and (2) entrepreneurial behavior—that is, bootstrapping (Bhide 1992) and bricolage (Baker and Nelson 2005).

I seek to offer three contributions. First, I seek to advance a two-stage process model of AL[1] that is embedded in psychological theories of decision-making under uncertainty and entrepreneurial behavior. I suggest that AL is an interaction between abilities and willingness, where loss aversion acts as the mechanism that triggers the transition from abilities to willingness. Since gains are uncertain and unable to be determined, willingness is framed as losses. In contrast to investment theories under risk, the reference point in the process model of AL consists of entrepreneurs' abilities rather than their aspiration levels. Second, I show that when constructing their abilities, entrepreneurs also actively engage in resourceful behaviors through effectual networks. Furthermore, entrepreneurial identity influences loss aversion. Finally, I seek to provide a detailed summary of AL's empirical measurements.

2 Literature review

2.1 The AL heuristic

AL is one of the five principles of effectuation (Sarasvathy 2008).[2] It is defined as what entrepreneurs can afford and what they are willing to lose in entrepreneurial investments (Dew et al. 2009b). Entrepreneurs who invest using AL attend to the downsides of entrepreneurial investments rather than predictions of future financial returns (Dew et al. 2009b). Investments within one's means are a preferred choice among entrepreneurs because the information on the downside of investments is easily accessible. Moreover, this information is endogenous and within the entrepreneurs' control (Dew et al. 2009b). On the contrary, information on the upside of entrepreneurial investments is exogenous, uncertain, unreliable, and beyond the entrepreneurs' control. Therefore, AL is in line with the logic that effectual entrepreneurs seek to influence or cocreate the future instead of predicting it (Sarasvathy and Dew 2003).

Consistent with the intellectual tradition of effectuation, AL is part of the cognition and behavior of expert entrepreneurs (Dew et al. 2015; Dew et al. 2009a). With deliberately accumulated experience and knowledge (Ericsson et al. 1993), experts think differently than novices (Baron and Henry 2010). Experts have enhanced metacognition (Mitchell et al. 2005) that enables them to self-regulate their cognitions (Haynie et al. 2010) and determine tasks that are required in complex and uncertain situations (Baron and Henry 2010). It is not to say that novices never reason like experts. However, novices lack the logical consistency that experts bring to their actions.

Though AL is one of the five principles of effectuation, this construct has been conceptualized in two opposite ways. On the one hand, AL is conceptualized as a reflective construct of effectuation (Perry et al. 2012) and hence is dependent on the other principles.[3] Using this conceptualization, Garonne and Davidsson (2010) found that AL as part of effectuation is positively related to gestation speeds for nascent firms developing higher degrees of innovation. Fisher (2012) found that AL is systematically observable in combination with the bird-in-hand and lemonade principles. Furthermore, Fisher posited resource constraints as the source of AL. Evald and Senderovitz (2013) found that AL as part of effectuation is helpful to explain how SMEs engage in corporate venturing activities. Finally, Alsos et al. (2016) found that communitarian social identity is strongly and positively correlated with AL as part of effectuation.

[1] Effectuation is considered to be in the domain of expert decision-making (Sarasvathy 2008), which views decision-making as nonsequential processes (e.g., Sinclair and Ashkanasy 2005). However, I put forward a sequential process to facilitate the discussion of the conceptual model.

[2] Together with the bird-in-hand, crazy-quilt, lemonade, and pilot-in-the-plane principles.

[3] Effectuation is a multidimensional construct (Werhahn et al. 2015), and the AL is dependent on the other principles of effectuation with the exception of the crazy-quilt and cocreation partnership principles (Chandler et al. 2011; Fisher 2012).

On the other hand, AL has also been conceptualized as a Type II formative construct of effectuation and as such, independent of the other principles (Chandler et al. 2007; Chandler et al. 2011; Reymen et al. 2017). Empirical research shows independent causalities between the principles of effectuation and the explanatory outcomes. For example, Read et al. (2009) found, in contrast with the other principles of effectuation, no relationship between the AL and higher new venture performance. Supporting Read et al. (2009), Smolka et al. (2016) also found, in contrast with the bird-in-hand, lemonade, and crazy-quilt principles, that AL is negatively related to venture performance. The authors' explanation of this observed relationship is that resource commitment is necessary for venture performance (George 2005; Wiklund and Shepherd 2003). Thus, focusing on minimizing potential losses (i.e., AL) works adversely for performance. Roach et al. (2016) found a contradictory positive relationship between AL and firm performance, although AL does not predict product or service innovation. Newbert (2012) found, in contrast with the lemonade principle, that expert entrepreneurs were more likely than novice entrepreneurs to consider their AL. Brettel et al. (2012) found, in contrast to the bird-in-hand and lemonade principles, that AL is positively related to R&D efficiency in projects with high innovativeness. Furthermore, these authors argue for AL as the regulatory element in effectuation.

Next to the reflective versus formative conceptualization of AL, a third view posits AL as independent of the bird-in-hand, lemonade, and crazy-quilt principles, with the pilot-in-the-plane principle as an antecedent of AL (Werhahn et al. 2015).

Additionally, empirical research shows that AL strengthens opportunity evaluation in cases of exploratory learning (Cai et al. 2016). AL also plays a role in the relationship between self-efficacy and effectual investments. Self-efficacy is positively related to effectuation (Engel et al. 2014) and entrepreneurial investments (e.g., Hsu et al. 2017). However, low levels of AL encourage experimentation and investments despite having low levels of self-efficacy and experience (Daniel et al. 2014). Finally, AL and the other principles of effectuation are positively related to new internet venture growth (Guo et al. 2016). The relationship between AL and new internet venture growth is mediated by resource-bundling strategies, in particular by pioneering resource bundling.

2.2 The components of the AL heuristic

AL consists of two components (Dew et al. 2009b)[4]: the ability and the willingness of the entrepreneur. The former is independent of an opportunity while the latter is opportunity specific.

2.2.1 The ability components

The ability is the size of what entrepreneurs can risk (Dew et al. 2009b) and is the objective reference point around which subjective assessments of willingness are undertaken. The ability determines which projects/ventures entrepreneurs can build (i.e., their initial choice set).

How do individuals construct their abilities? Individuals go through a process of mental accounting. Thaler (1999, p. 183) defines mental accounting as "the set of cognitive operations used by individuals and households to organize, evaluate, and keep track of financial activities." Mental accounting consists of three main components. First, the implicit process of opening, closing, and evaluating financial outcomes, such as transactions, gambles, and investments (Benartzi and Thaler 1995; Thaler 1980). Second, accounts are divided into consumption categories and budget, and expected income is (de)coupled from payments (Prelec and Loewenstein 1998; Thaler 1980). Third, accounts are not fungible (Thaler 1999). In other words, accounts are treated as separate, and during investment decisions, the possible interactions between accounts are ignored (Grinblatt and Han 2005). For example, monthly wages are often associated with reoccurring household-related expenses such as mortgage and are not used for investing. Third, mental accounting consists of "choice bracketing" (i.e., the frequency with which accounts are evaluated [Thaler 1999]).

When individuals go through a mental accounting process to construct their abilities, individuals will create income and expense accounts especially for investing. The ability component of AL is also determined by the type of accounts. Individuals are more willing to risk resources that are considered to be windfall gains (Arkes et al. 1994) rather than expense accounts such as retirement, college funds, and housing equity. For example, individuals are more willing to invest their inheritances or gifts in pursuing entrepreneurial endeavors (Blanchflower and Oswald 1998).

[4] I view the components as the stages of the process model of the AL.

2.2.2 The willingness component

The second component of AL is the willingness to risk specific things when making investment decisions (Dew et al. 2009b). Willingness captures the subjective task value (Eccles 1983), the motivation that determines entrepreneurial investments into specific venture projects and the level of each investment. This willingness is closely intertwined with the opportunity in which it is invested. Entrepreneurs who make use of AL to make investment decisions perceive uncertainties. These uncertainties emerge from sources such as the lack of complete information and cognitive inabilities (Duncan 1972; Wu and Knott 2006). Under such conditions, entrepreneurs that use AL adopt a control logic (Sarasvathy 2001) and enact their environments (Weick 1969). This means that these entrepreneurs take active roles in cocreating their environments, which also include the opportunities in which these entrepreneurs invest. This cocreation of opportunities is influenced by how much and which resources entrepreneurs are willing to invest. Thus, the willingness of the entrepreneur is closely intertwined with the opportunity that gets constructed.

In addition, entrepreneurs do not only exercise influence on their environments, but also allow their environments to influence them (Sarasvathy and Dew 2003). These coshaping processes between entrepreneurs, their environments, and their opportunities influence the projects or ventures entrepreneurs pursue and the level of their investments. For example, Daniel et al. (2014) show that both the development of products that require little knowledge or experience and commercialization efforts that are cost effective lead to low willingness to invest larger amounts or to take external funding.

2.3 Embedding the AL heuristic in decision theories and entrepreneurial behavior

Investment decisions under uncertainty have been a part of economic psychology—for example, prospect theory (Kahneman and Tversky 1979). The philosophical roots of AL lie in behavioral economics (Dew et al. 2009b). To advance AL requires further positioning within the psychology of choice and how decisions are framed (Tversky and Kahneman 1974). With that in mind, I examine loss aversion (Kahneman and Tversky 1979) and affect (Loewenstein et al. 2001; Slovic et al. 2004). Additionally, entrepreneurship involves taking action, often in resource-constrained environments. Research shows that AL is positively related to venture growth when it is mediated by resource bundling (Guo et al. 2016). Therefore, I also incorporate the entrepreneurial behaviors of bootstrapping (Bhide 1992) and bricolage (Baker and Nelson 2005).

2.3.1 The role of loss aversion

Loss aversion is the psychological tendency for individuals to be more sensitive to losses than equivalent gains compared to a reference point, such as current assets (Kahneman and Tversky 1979), status quo (Benartzi and Thaler 1995), or expectations (Abeler et al. 2011). Loss aversion is a fundamental feature of prospect theory, together with reference dependency and diminishing sensitivity (Kahneman and Tversky 1979). Loss aversion suggests that individuals take risks to avoid losses (Barberis and Huang 2001).

Age, income, and wealth increase loss aversion, while education decreases loss aversion (Johnson et al. 2006). In addition, loss aversion can be explained by individuals' knowledge of the decision, the importance of the decision to individuals, and age (Johnson et al. 2006). Furthermore, bankruptcy laws influence loss aversion (Estrin et al. 2017). However, entrepreneurs have been shown to have lower loss aversion than managers and employees (Koudstaal et al. 2016).

2.3.2 The role of bootstrapping

Bootstrapping is considered to be a behavior of entrepreneurial resourcefulness (Brush 2008) along with bricolage, improvisation, and thrift (Powell and Baker 2014).[5] Bootstrapping is defined as "an alternative resource management approach directed at avoiding market-based transactions" (Grichnik et al. 2014, p. 311). It consists of two components: (1) acquisition of resources, and (2) efficiently using the resources (Lahm Jr and Little Jr. 2005). Winborg and Landström (2001) classify bootstrapping into six categories: (1) owner financing, (2) minimizing accounts receivable, (3) joint utilization, (4) delaying payments, (5) minimizing stock, and (6) subsidy financing.

[5] Resourcefulness is defined as "attempting to deal with problems or opportunities despite ostensibly inadequate resources" (Powell and Baker 2014) and is considered to be a process of cognitive self-regulation (Bradley et al. 2011).

Bootstrapping is a behavior wherein entrepreneurs enact their environments (Powell and Baker 2014). The behavior is often short term and reactive to cope with contextual constraints (Welter and Smallbone 2003), and can also include illegal behaviors such as bribery (Welter and Xheneti 2013).

Empirical research shows that bootstrapping is mostly used in high-tech firms (Auken 2005), that too much bootstrapping does not benefit the firm (Grichnik et al. 2014), and that bootstrapping firms are more likely to use customer-related and delayed payments (Ebben 2009). Furthermore, bootstrapping is not only a matter of last resort (Winborg and Landström 2001), it is also a deliberate choice (Winborg 2009). Additionally, uncertainty is positively related to the perceived importance of bootstrapping (Carter and Van Auken 2005), and firms use bootstrapping to reduce risks and expenses (Lahm Jr and Little Jr. 2005).

2.3.3 The role of bricolage

Similar to bootstrapping, bricolage is also considered a behavior of entrepreneurial resourcefulness (Brush 2008). Bricolage is defined as "making do by applying combinations of the resources at hand to new problems and opportunities" (Baker and Nelson 2005, p. 333) in penurious environments. Those are environments that "present new challenges, whether opportunities or problems, without providing new resources" (p. 353).

Bricolage and AL have in common the view of resource constraint as a source of creativity (Fisher 2012; Reymen et al. 2015). Bricolage entails entrepreneurs coping with constraints through trial and error and learning by doing processes that are ambiguous, socially complex (Steffens et al. 2010), and path dependent (Garud and Karnøe 2003). In coping with the constraints, bricoleurs use their resources in new and creative ways that challenge established institutions (Baker and Nelson 2005). Bricoleurs also use discarded, unwanted, and untapped resources that others fail to recognize (Di Domenico et al. 2010).

2.3.4 The role of affect

Affect is the "specific quality of goodness or badness (a) experienced as a feeling state (with or without consciousness) and (b) demarcating a positive or negative quality of a stimulus" (Slovic et al. 2005, p. S36). Affects are anticipatory emotions—that is, emotions that are experienced at the time of the decision-making (Loewenstein et al. 2001).[6] On the one hand, affect is based on experience and a stimulus (i.e., the integral affect), and on the other hand, it is independent of a stimulus but can be assigned to a stimulus and influence the decision-making process (i.e., incidental affect) (Peters et al. 2006). In both cases, the experienced affect drives our willingness (Loewenstein 2000).

The characteristics of individuals and tasks, as well as interactions between the two (Slovic et al. 2005), and contextual factors (e.g., the importance/relevance of the decision, decision complexity and familiarity, cognitive [in]abilities, time pressure, and how the information is presented [Peters et al. 2004; Peters et al. 2006]) all make individuals rely on their feelings in decision-making processes; this is the affect heuristic (Finucane et al. 2000). The affect heuristic is also how individuals relate to the risks and benefits of activities, and it influences decisions (Baron 2008). Prior work has shown that if feelings are favorable, risks are judged low and the benefits high—and vice versa if feelings are unfavorable (Slovic et al. 2005).

Relationships between affect, information processing, and behavior are circular (see Fig. 1). Affect influences the use of heuristics in making decisions, which influences behaviors. Positive affect propels the use of affect heuristics in making decisions, whereas negative affect drives individuals toward analytic reasoning (Baron 2008). Interestingly, behaviors can also create affect. For example, when individuals make progress toward the realization of a goal as a result of an increase in their efforts, the outcome is a positive affect (Carver 2006; Locke and Latham 2002). Positive affect is also created by feedback received regarding one's behavior and abilities. Individuals who received positive feedback have a higher expectancy than individuals who received negative feedback (Gatewood et al. 2002).

With a view to incorporating AL into the above four connected streams of literature from the psychology of decision-making, I undertook an exploratory study that helped me identify specific mechanisms of interest to effectuation scholars. I describe the study next.

[6] Gendron and Barrett (2009) argue that affect is not equal to emotion. These authors argue that affect is more fundamental to the psyche of the individual and that "an emotion emerges when a person's internal state is understood in some way as related to or caused by the situation."

3 Methods

3.1 Research strategy

An exploratory research strategy consisting of multiple cases (Yin 2009) is particularly useful in the context of AL, given that this phenomenon is poorly understood. This is in line with the argument that "the central notion is to use cases as the basis from which to develop theory inductively" (Eisenhardt and Graebner 2007, p. 25). Furthermore, the research task here is one of theory elaboration. According to Fisher and Aguinis (2017, p. 438), "Theory elaboration is the process of conceptualizing and executing empirical research using preexisting conceptual ideas or a preliminary model as a basis for developing new theoretical insights by contrasting, specifying, or structuring theoretical constructs and relations to account for and explain empirical observations." Theory elaboration can use both an inductive and abductive approach (Timmermans and Tavory 2012). Case studies are especially well suited for this purpose (Ketokivi and Choi 2014).

3.2 Selecting case participants

The cases were selected using theoretical sampling (see Appendix Table 3). This method is appropriate for research where the purpose is to develop theory (Eisenhardt and Graebner 2007). In developing the selection criteria, and as suggested by Miles and Huberman (1994 as cited in Curtis et al. 2000), I first took into consideration the axioms suggested by effectuation—namely, that the participants should have perceived uncertainty, should be expert entrepreneurs, and should have introduced innovative products. To determine the level of expertise, I considered a combination of the number of new ventures started and the number of years working in a new venture as a (co)founder. An entrepreneur with experience in four or more new ventures and with 10 or more years as a (co)founder is considered to be an expert. Next, I considered the research question. The research question pertains to the internal mechanisms of AL. This resulted in an additional criterion that participants should have used AL to make investment decisions. Subsequently, I strived to obtain cases that can generate rich information on the mechanisms of AL. Considering the importance of the entrepreneurial team (West 2007), I added the "team" as a criterion. Finally, I also sought to obtain cases to increase the generalizability of findings and sought for additional cross-case variation. I specifically sought out polar opposites of the existing criteria (except for criteria relating to the axioms of effectuation and the research question). These included entrepreneurs who were novices, who introduced noninnovative products, and who acted solo. Experience with one new venture and between one and 5 years of experience as a (co)founder is the definition of a novice. For intermediate levels of expertise, I included entrepreneurs involved in two or three new ventures and who had between six and 9 years of experience as a (co)founder. For example, TransactionCo consisted of two co(founders), both with 14 years of experience in this position, but experience with only one new venture. These participants have been rated as entrepreneurs with intermediate level of expertise. I also added the (un)successful outcome of a new venture as criteria and sought for cases at different stages of venture development.

The cases were selected from Curaçao, a small island in the Caribbean with a population of 156,971 (January 1, 2015) that is situated north of Venezuela. I approached the local entrepreneurial community. First, I established contact with a cofounder or cofounders. I used snowball sampling (where applicable) to develop each case, as a result of a first wave of interviews with early precommitted stakeholders. I selected seven cases in information and communications technology, entertainment, communications electronics, consulting of security services, and information- and data-processing services and consultancy (see Appendix Table 4 for a description of the cases).

3.3 Themes for data collection

Several scholars have sought to develop empirical measurements of AL. These studies mostly measure AL using multiple items on a Likert-type scale (see Appendix Table 5 for an overview). Most indicators measure willingness (e.g., "we are careful not to commit more resources than we could afford to lose" (Chandler et al. 2011)). Two exceptions are "finding unused resources in a local environment (including subsidies)" (Reymen et al. 2015) and "how much money [the respondents] were able to save" (George et al. 2015). The latter two indicators measure the ability.

The most-used empirical measurement indicators for AL is Chandler et al. (2011). However, this measure has been improved in more recent research. Therefore, I

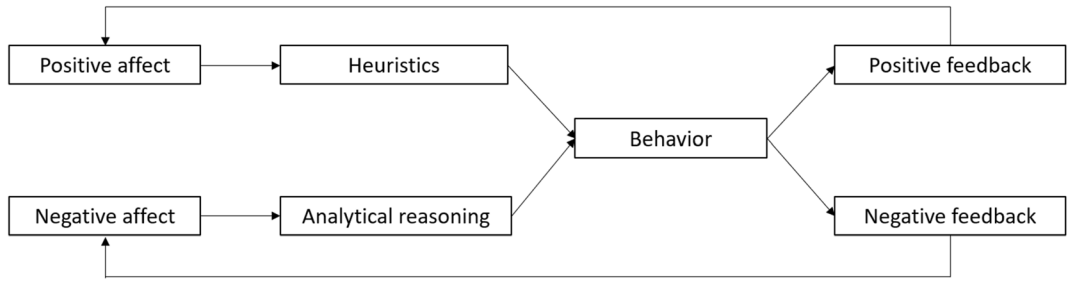

Fig. 1 The relationships among affect, information processing, and behavior

used the empirical indicators developed by Reymen et al. (2015), who took into account the indicators developed by Chandler et al. (2011), Fisher (2012), and Read et al. (2009). I chose to use the indicators developed by Reymen et al. (2015) because these were assessed to be suitable for this study for two reasons. First, Reymen et al. (2015) present comprehensive five-item measurement indicators for qualitative measurement of AL that are suitable for explorative research using in-depth interviews. Other indicators, as proposed by Chandler et al. (2011), use Likert-type scales that are more suitable for explanatory survey studies. Second, the indicators developed by Reymen et al. (2015) also measure the ability component, unlike the indicators developed by other authors that measure only the willingness.

During coding and data analysis, several new themes emerged and were added to the empirical measures derived from Reymen et al. (2015). One new theme pertained to ability and three to willingness. "*Sources of ability*" measures the ability of entrepreneurs to commit resources to any venture and indicates where entrepreneurs acquire the funds that they can afford to invest. The three new measures of willingness consist of the following: *(1) The initial product idea is seen as interesting and worth exploring; (2) investment requirements are seen as uncertain and there is a desire to minimize this uncertainty;* and *(3) investment is seen as a first necessity to create an opportunity to start the development of a product.* When entrepreneurs develop their initial ideas, although the feasibilities of these ideas are uncertain, they are seen as interesting and worth exploring, which leads entrepreneurs to initiate investments. Entrepreneurs invest their resources under control in exploring a multiplicity of possibilities (Sarasvathy 2001), making small investments to "test the waters," gain legitimacy and commitments, and create possibilities to start exploiting the opportunities.

In sum, the study uses seven-item measurement indicators, two that measured the ability component, and five that measured the willingness component of AL.

3.4 Data collection

The data were collected primarily through in-depth interviews, in addition to documents accessed from the participants (e.g., business plans) and other sources (e.g., media, press releases, and websites) (Pollock and Lashley 2014). Triangulation was achieved by including multiple data sources, including interviews with multiple respondents from the (cofounding) teams.[7] I interviewed each participant separately, followed by several rounds of informal communication. This strategy proved to be useful to minimize the researcher's bias and retrospective sensemaking (Chenail 2011). The interviews lasted between 45 minutes and 1.5 hours. In Table 1, I present an overview of the data collected. I signed nondisclosure agreements to assure confidentiality of sensitive information connected with participants' competitiveness. I also signed noncompete agreements that restrict me from founding or investing in companies that compete with participants. All cases have also been disguised to preserve their privacy.

3.5 Coding and analytical strategy

I coded and analyzed the data through a pattern-matching approach (Yin 2009) and cross-case analyses (Eisenhardt 1989). I studied critical incidents using "open coding" (Locke 2001). The goal was to capture the thought processes and decision logic of the critical

[7] For three cases—namely, GameCo, PostCo, and SecurityCo—I interviewed only the founder, either because the founders indicated that there were no other individuals who contributed to the development of the product and exploitation of the opportunity, or because the individuals were not available for interview.

incidents. I matched the decision logic with the indicators for AL. To avoid bias where one critical incident is overrepresented, I excluded all decision logic that captured the same incidents. Table 2 presents the empirical indicators with exemplary quotes.

4 Findings and discussion

4.1 Use of components of the AL heuristic

The analyses revealed several interesting aspects of each of the two components of AL. I first present these below and then put them together into a process model.

4.1.1 Use of the ability component

As expected from mental accounting (Thaler 1980), the data show that individuals construct their abilities to invest in new ventures from different "accounts" of resources. Two interesting insights emerged regarding the accounts. First, in addition to money, entrepreneurs found unused resources in their local environment. For example, in the initial stages of prototype development, PostCo looked for individuals who could help to acquire resources to build the prototype. The founder of PostCo approached an uncle who was a carpenter to provide the wood that could be used to build a mailbox. PostCo developed the design of the box, and the uncle helped in making the box (Martina 2016). Data also revealed multiple sources of money, such as personal savings (e.g., MusicCo stated "For [the first] two years we invested our own money"), savings from other businesses (e.g., BudgetCo stated "Those [invested funds] came from other businesses that I have"), and bank loans (e.g., SecurityCo "The first project was a prefinancing…[the prospect customer] signed the formal contract and subsequently I went to a bank"). The findings here are in line with prior studies of entrepreneurial funding (Daniel et al. 2014; Gelderen et al. 2013).

Second, the entrepreneurs in this study referred to their abilities not only in terms of monetary resources but also in terms of other resources, such as time and knowledge. For example, PaymentCo referred to time as an investment. Time as an investment has been referred to in prior research as sweat equity (Dew et al. 2009b). Time is perishable, and the loss of it is more tolerable than the loss of money (Soman 2001). Therefore, the time that entrepreneurs possess influences which projects and ventures they can build. In effectuation research, Fischer and Reuber (2011) found that time is perceived as an AL and influenced how much entrepreneurs invest in creating interactions on social media.

Knowledge was also mentioned as a resource. For example, GameCo stated "I also designed the game myself…I am actually a graphic designer, which currently involves more and more apps and websites." As evident by the quote, knowledge (and skills) are also considered AL abilities that entrepreneurs invest in a new venture.

4.1.2 Use of the willingness component

The data showed that entrepreneurs in the study invested limited amounts of personal/company money, time, and effort. For example, the founder of PaymentCo stated that, "For me [the investment] is *just* time," indicating that the time invested is minimum and bearable. The entrepreneurs were also willing to make personal sacrifices. For example, an interviewee from PaymentCo stated that, "You need something you're willing to lose…What comes after that, we finance via projects in another way."

In addition to the measurement indicators following Reymen et al. (2015), I also observed from the data that the initial product ideas were seen as interesting and worth exploring (e.g., BudgetCo stated "The problem that [this product] will solve; the feasibility of the product/platform; the trends in innovation for mobile payment methods [are interesting]."). Additionally, investment requirements were seen as uncertain and there were desires to minimize the uncertainty (e.g., the founder of GameCo stated, "At that time, you could not find anywhere information [about app development], so I had no idea how realistic everything was. [Determining how much money to invest] was very difficult because I had no idea how much [the product development] should cost."). These examples show that under conditions of perceived uncertainty, entrepreneurs are willing to bear risks and make AL investments to act on their initial ideas.

In summary, the data provide evidence of both abilities and willingness as components of AL. The data also show evidence of interactions with entrepreneurial behavioral and decision-theory concepts. Building on these interactions next, I propose a two-stage process model of AL.

Table 1 Overview of the data collected (Martina 2016)

Case	Interviews	Emails	Who was interviewed	Site visits	Archival documentation quantities	Archival documentation type	Period covered
BudgetCo	4	1	Two co-founders		5	Business plans (multiple iterations), Certificate of Registration Chamber of Commerce Curaçao	2012–2014
GameCo	2	1	Founder		12	Certificate of Registration Chamber of Commerce Curaçao, online promotion, sketches, third-party reviews, website	2010–2015
MusicCo	9	4	Two cofounders, two early employees	2	31	Certificate of Registration Chamber of Commerce UK, email communication, presentation slides to artists, press releases, published interviews, website	2012–2014
PaymentCo	4	1	Founder, external partner		1	Certificate of Registration Chamber of Commerce Curaçao	2008–2015
PostCo	2	3	Founder		2	Patent, press release	2007–2009
SecurityCo	2	1	Founder		4	Certificate of Registration Chamber of Commerce Curaçao, establishment permit, Facebook page	2009–2014
TransactionCo	6	1	Two cofounders, partner		17	Certificate of Registration Chamber of Commerce Curaçao, job advertisements, newsletters, press releases, social media pages, third-party websites	2000–2014

4.2 A process model of the AL heuristic

Building upon the established literature on effectuation as well as the new data I collected, I began putting together the two-stage process model in Fig. 2. The model starts with entrepreneurs' perceptions of their investment decisions being uncertain. Stage one of the process addresses the question "Which projects/ventures can you build?" In this stage, entrepreneurs consider their abilities. Stage two addresses the question "Do you want to build this project/venture?" In this stage, entrepreneurs consider their willingness. Loss aversion triggers the transition from the first to the second stage. The outcome is entrepreneurs investing. Both components of AL and loss aversion have antecedent(s).

4.2.1 The start: perceived uncertainty

The AL process starts with entrepreneurs seeking to build ventures in environments perceived to be uncertain.[8] The uncertainties experienced are, for example, with potential stakeholders. For instance, the founder of PaymentCo stated that "[Partnerships with banks] is where I see some risk because [PaymentCo] is a system that does not have any product reviews yet. It is still being built. [The banks] have to agree with something that they have not seen, they do not know if it is successful." Perceived uncertainties lead effectual entrepreneurs to adopt an experimental attitude (Smolka et al. 2016) and refrain from using causation-based methods. For example, the founder of MusicCo stated that, "The reason why we wanted to finance everything was because we didn't want to take a lot of risks. We never really made a budget of how much [the product development] was going to cost us. We just started with [the new venture]. [Starting and running MusicCo] was really something we didn't have a clue about. We didn't know how things were going to evolve, so we felt like a business plan was really static."

4.2.2 Stage 1: Which projects/ventures can you build?

Investments based on AL happen through two stages. In the first stage, entrepreneurs determine which projects/

[8] Besides applying the AL, entrepreneurs can also make efforts to decrease or subdue the uncertainty (Lipshitz and Strauss 1997).

Table 2 Empirical measurement indicators and exemplary quotes

Empirical measurement indicators	Exemplary quotes of incidents
Ability	
Finding unused resources in the local environment (including subsidies).	In the initial stages of the prototype development, [PostCo's founder] looked for people around him who could help him acquire the resources to build the prototype. For example, he approached an uncle who was a carpenter for wood that he could use to build a mailbox. He developed the design of the box and his uncle helped him make it. (PostCo)
Sources of ability.[a]	"Those [invested funds] came from other businesses that I have." (BudgetCo)
Willingness	
Investing limited, small amounts of personal/company money, time and effort.	"For me [the investment] is just time." (PaymentCo)
Willingness to make sacrifices.	"You need something [that] you are willing to lose…what comes after that, we finance via projects in another way." (PaymentCo)
The initial product idea is seen as interesting and worth exploring.[a]	"The problem that [this product] will solve; the feasibility of the product/platform; the trends in innovation for mobile payment methods [are interesting]." (BudgetCo)
Investment requirements are seen as uncertain and there is a desire to minimize this uncertainty.[a]	"At that time, you could not find anywhere information [about app development], so I had no idea how realistic everything was. [Determining how much money to invest] was very difficult because I had no idea how much [the product development] should cost." (GameCo)
Investment is seen as a first necessity to create an opportunity to start the development of a product.[a]	"It is not as the funds are not there. I see things are necessary to keep doing things as these have to be done." (BudgetCo)

[a] Italicized items are self-developed

ventures they can build by constructing their abilities. The abilities are constructed through a process of mental accounting (Benartzi and Thaler 1995; Thaler 1980) and the (de)coupling of payments (Prelec and Loewenstein 1998). Entrepreneurs open/close income and expense accounts related to their new ventures. In this process, entrepreneurs also consider their anticipated future earnings (Chrisman and Patel 2012). For example, the founder of PaymentCo indicated the intention to use expected future earnings from other projects to fund its operations. This mental action implies that the founder of PaymentCo works on other projects next to or in between the PaymentCo project. In mitigating uncertainties and coping with resource constraints, entrepreneurs often are part-time entrepreneurs[9] (Petrova 2012), and also combine multiple projects that fund each other (Daniel et al. 2014). The combination of part-time wage employment and additional projects, also called hybrid entrepreneurship (Folta et al. 2010), allows entrepreneurs to allocate future earnings to their entrepreneurial investments.

A salient characteristic of the mental accounting processes undergone by entrepreneurs using AL regards the (de)coupling of payments. Individuals usually decouple payments to reduce the perceived cost associated with an activity (Thaler 1999). However, entrepreneurs (de)couple payments only when these processes enable the entrepreneurs to "stretch" their resources. For example, credit purchases are often made by entrepreneurs to postpone paying the expenses (e.g., MusicCo). Where ordinary individuals like prepayments to decouple the use from the payment, entrepreneurs using AL are hesitant about this practice, and prefer delaying payments (Winborg and Landström 2001).

4.2.3 Increasing the ability through resourcefulness

The ability component of AL is actively constructed through several forms of resourceful behaviors, not only limited to bootstrapping (Bhide 1992) and bricolage (Baker and Nelson 2005), but also including the use of effectual networks (Sarasvathy and Dew 2003).

Entrepreneurs engage in bootstrapping activities to increase their abilities. For example, the founder of

[9] Part-time entrepreneurs are those who work regular wage jobs some of the time and the rest of the time invest in their own entrepreneurial endeavors.

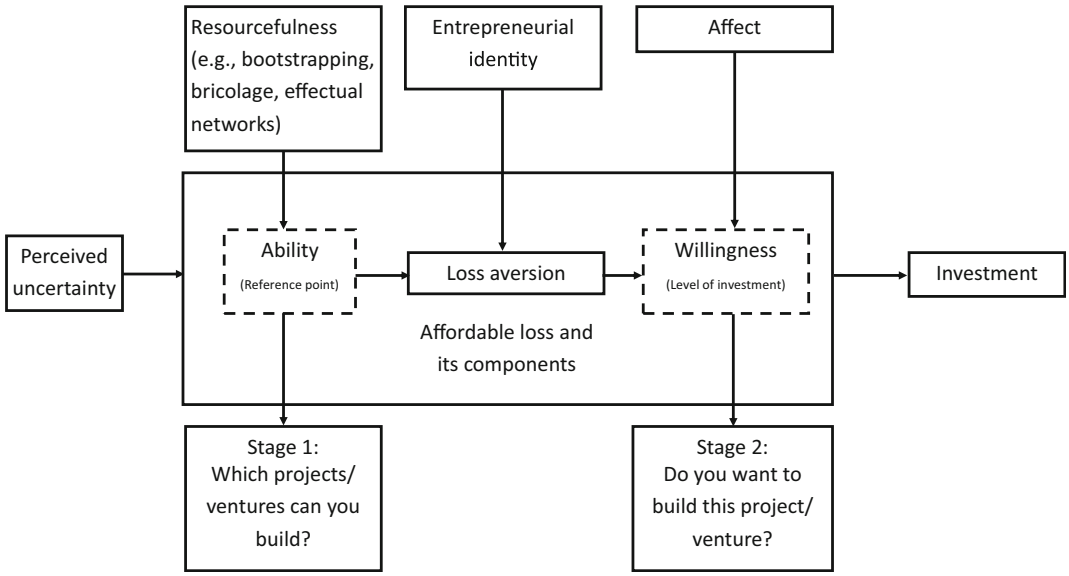

Fig. 2 A process model of AL

BudgetCo stated that, "If I had money, I would implement the software, take some risks, and maybe things would go a bit faster. [However], I choose another model where the supplier will rent us the platform so we do not have to pay a lot of money in advance." MusicCo also used bootstrapping activities. For example, the founder stated that "What we did with [the marketing employee] then was that she would work part-time for [MusicCo] and she would work part-time [at another company where I am a director], because [at the other company] she could go on the payroll. So, that way, we found a way to make [her employment at MusicCo] attractive for her."

Consistent with findings regarding multiple ways to enhance ability, entrepreneurs applied bootstrapping to more domains than the financial. For instance, MusicCo applied bootstrapping in human capital. Although conventional wisdom about bootstrapping is limited to the financial, social and human capital are also vital domains of bootstrapping (Bradley et al. 2011).

Entrepreneurs also engage in bricolage activities to increase their abilities. For example, PostCo could not afford a sensor for its product. PostCo dealt with this constraint by repurposing two old cables that were left over from a different project into the sensors that PostCo required.

Finally, entrepreneurs create effectual networks (Sarasvathy and Dew 2003) to increase their abilities. Entrepreneurs in the AL process reflect on who they are, what they know, and whom they know (Sarasvathy and Dew 2005) and subsequently enter a process of interaction with potential stakeholders who commit to expanding the entrepreneurs' abilities (Dew et al. 2010; Wiltbank et al. 2006). For example, SecurityCo's partners were individuals with whom SecurityCo had worked in the past. The founder of SecurityCo stated that, "I already knew [the partners]. I knew their work, and I told them to come help me." Similarly, TransactionCo partnered with individuals who were already part of the founder's social circle. The founder of TransactionCo stated that, "When I used to work for the bank, [our software developer] used to already develop things for us."

The effectual network is an expanding cycle (Sarasvathy and Dew 2005), and entrepreneurs are continually evaluating who they are, what they know, and whom they know to increase their abilities. The founder of PaymentCo eloquently expressed this process as follows:

> "If you go to a networking reception, you never know who you will meet. The one you meet, talk to, [with whom] there is a vibe, and [who] invites you to a meeting, that is the one that can turn into something. And [I], as an IT entrepreneur, [am] always looking for two things, testers and graphic designers. Always, when I speak with testers and graphic designers, I explore the possibilities."

4.2.4 Stage 2: Do you want to build this project/venture?

In stage 2 of the AL process, entrepreneurs evaluate if a project/venture is worth building by examining how much of their resources they are willing to commit to it. In other words, the entrepreneurs' willingness determines their level of investment. But it is not the predicted investment for the venture as a whole that drives their decision. Rather, they are focused on the next step and what it would take to build that step. For example, the founder of BudgetCo stated, "It is not as [though] the funds are not there. I see things are necessary to keep doing things, as these have to be done."

4.2.5 Affect influencing the willingness

Willingness is influenced by affect. Emotions are also related to effectuation (and the AL) (Ye 2011) and influence willingness. The data show that emotions can have strong effects. For example, SecurityCo stated:

> "There was talk about [searching for funds elsewhere]. I talked to more individuals. However, that option was never explored, although you hear that there are individuals willing to invest. However, I never have approached anyone...I think because I practically shut down emotionally...My focus was very off track. The mindset, the world I lived in at that moment was a lot of negative things…I simply blocked myself for opportunities."

As the example shows, a negative affect increases risk aversion (Slovic et al. 2005) and reduces willingness. On the other hand, a positive affect, such as passion, induces goal commitment (Drnovsek et al. 2016) and is related to riskier investments (Foo 2011). For example, the founder of GameCo stated:

> "For the first time, a lot of money has been invested. What I got back, I'm not satisfied with it…I have now a Portuguese developer…They have given a very good deal...They said that [they] will also invest in [the development of the product]. [They do] not charge you the normal price. [They] will charge [me] something but much lower than [I] would normally [be charged]…I want to put in money, but to finish it, and also can be proud."

4.2.6 From ability to willingness through loss aversion

The transition from determining which projects/ventures they can build to evaluating if a project/venture is worth building occurs through the corridor of loss aversion. In general, human beings are loss averse (Kahneman and Tversky 1979). This includes entrepreneurs. However, under conditions of uncertainty, AL entrepreneurs do not have information about expected gains. For that reason, they are "no longer deducting the probability of failing from the expected gains, but examining the value of the venture in terms of certain failure and asking if it would still be worth attempting" (Sarasvathy 2015, p. 313). For example, the founder of MusicCo stated that, "The reason why we wanted to finance everything was because we didn't want to take a lot of risks." An alternative to self-financing is outside financing (e.g., debt financing), with which there are additional costs (e.g., interest payments) associated. In downside scenarios, entrepreneurs who use outside financing will have more debt. Debt is experienced as unpleasant (Prelec and Loewenstein 1998) and induces entrepreneurs to be more risk averse in countries with stringent bankruptcy laws (Estrin et al. 2017).

Loss aversion serves as the connecting corridor to determining willingness in two different ways. On the one hand, loss aversion may induce entrepreneurs to invest to avoid losses. Individuals seek to take risks to avoid losses (Barberis and Huang 2001). For example, the founder of GameCo stated, "I [invested] because otherwise I would have to pay a very large portion of that money to taxes." If this income were not invested, a portion of it would have been lost to corporate taxes. On the other hand, loss aversion may hinder entrepreneurs from investing, as in the example above, of entrepreneurs operating in countries with strict bankruptcy laws. In these circumstances, entrepreneurs who are loss averse will limit their willingness (Dew et al. 2009b).

The above example also illustrates that entrepreneurs' willingness is reference dependent—meaning that, as the referential frames or points change, the willingness also changes (Tversky and Kahneman 1991). In AL, entrepreneurs compare their abilities to their losses (Kahneman and Tversky 1979). Entrepreneurs show status quo biases in their decision-making

(Burmeister and Schade 2007) and have a tendency to repeat previous choices. Maintaining status quo is equal to Tversky and Kahneman's (1991) Willingness-To-Pay versus Willingness-To-Accept disparity (Burmeister and Schade 2007) (i.e., individuals' efforts to maintain their abilities). Thus, when entrepreneurs determine their investments, they consider how much of their abilities they would like to maintain or put at risk, or enhance, which makes the entrepreneurs' abilities the reference point.[10]

In summary, loss aversion stimulates or restricts how much entrepreneurs are willing to risk.

4.2.7 Entrepreneurial identity influencing loss aversion

Loss aversion is in turn influenced by the entrepreneur's identities: who they are and who they want to become. Entrepreneurs use their (aspiring) identities to create legitimacy among stakeholders (Navis and Glynn 2010). For example, one of the founders of TransactionCo stated:

> "[Customer acceptance] becomes difficult if you are selling a product—and we are selling a product—[for which] the copyright is somewhere else...You have a problem that [the customers] would not believe in you. We decided it was time to put [the architectural design and software programming of the product] under one company, and I became the third partner."

Influenced by the entrepreneurs' beliefs (Krueger 2007), these investments can be considered a "rite of passage" (Turner 1974; Gennep 2013) to obtain new entrepreneurial roles and identities (Murnieks and Mosakowski 2007). The roles are the expectations of individuals' behaviors external to the individuals, and the identities are the cognitive schemas that individuals take as they assume new roles (Stryker and Burke 2000). Darvin and Norton (2015, p. 46) suggest that "because learners want to be part of a country or a peer group, to seek romance, or to achieve financial security, learners invest because there is something that they want for themselves." Although Darvin and Norton (2015) is in a different domain, it may be generalized to the behavior of entrepreneurs. When making the investments, entrepreneurs have various roles they can take, and thus, face ambiguities around which roles are preferred (Hoang and Gimeno 2010). To cope with these ambiguities, entrepreneurs make investments to reinforce their new roles and identities. For example, simply believing that entrepreneurs are risk takers can lead to a lower loss aversion. In this sense, any identity belief and aspiration to that identity role can impact levels of loss aversion.

4.2.8 The outcome

Finally, the outcome of the AL process model is an entrepreneurial investment. Entrepreneurs who use AL have considered which projects/ventures they can build for AL, have chosen a specific project/venture in which they are willing to invest at a specified level of AL, and then make that AL investment.[11]

5 Conclusion

5.1 Implication

In this paper, I aimed at making three theoretical contributions in addition to an empirical one. First, I sought to advance a two-stage process model of the AL that is embedded in psychological theories of decision-making under uncertainty and entrepreneurial behavior. The reference point is the entrepreneurs' abilities instead of aspiration levels, as suggested by other theories of investment under uncertainty. Second, I also showed that aside from bootstrapping and bricolage, effectual networks have vital roles in entrepreneurs constructing their abilities. Third, I also showed the importance of affect and entrepreneurial identity. Finally, I provided a detailed summary of the empirical measurements of the AL.

[10] Some studies conceptualize the reference point as aspiration levels (Morgan and Sisak 2016): the aspired level of the performance of entrepreneurs relative to their current level of resources (Wennberg et al. 2016, p. 410). I distance myself from this view since it requires entrepreneurs to have an expected level of return. In the process model of the AL, I seek to advance the view that entrepreneurs rely on the downside of their investments and not the expected levels of return.

[11] There might be cases wherein, though the entrepreneur has the willingness to invest, it is not possible due to regulatory policies. For example, foreigners are not allowed to own more than between 25% and 50% of newspaper portfolios in Australia.

This model proves to be a fruitful lens through which to look at entrepreneurial investment decisions under uncertainty. For instance, in searching for a link between the social identity of entrepreneurs and their entrepreneurial behaviors, Alsos et al. (2016) found that communitarian entrepreneurs (i.e., entrepreneurs that serve their community with their products) make use of AL. The process model of AL developed here helps highlight how communitarian entrepreneurs take into consideration several types of resources from different sources and couple each of those to an investment account. For example, in an investigation of a mountain guiding venture, Alsos et al. stated, "We invest in some equipment…Everything you see here is something we have received or made ourselves" (p. 10). The role of entrepreneurial identity is also visible in the case. "The mountain guiding entrepreneurs had been mountain climbing and skiing their entire adult lives and had a strong identity related to this" (p. 13). Based on these statements, we can interpret the investments made by mountain guiding as being led by their abilities—namely, equipment that was self-made and received—as well as their willingness, which was influenced by their identities as mountaineers. In other words, the process model of AL developed above can help deepen our understanding of findings from several extant studies of effectuation.

The process model of AL is also applicable to nonentrepreneurial investments—for instance, in small firms. In their study, Berends et al. (2014) found that small firms used AL early in the innovation process. Looking at the results of that study through the lens of the process model of AL shows that Beta's ability to invest in the development of the stirrup suspender was constituted out of different sources, namely, government subsidies and grants. We also observe the influence of entrepreneurial identity as Beta invests in the development of a mechanical solution "that works" (p. 629) while the better version (i.e., the pneumatic solution) is reserved for later. Thus, Beta started the investment to gain the identity and legitimacy of being a manufacturer of stirrup suspenders.

5.2 Limitations

Viewed purely from an empirical stance, the study above exhibits a few limitations regarding the data and external validity (Martina 2016). For three out of the seven cases (i.e., GameCo, PostCo, and SecurityCo), only the founders were interviewed. These founders were all solo entrepreneurs. More importantly, the data were not coded by independent researchers. Finally, the data were collected from a small number of cases from Curaçao, thereby limiting its generalizability. However, I used the data primarily for theory elaboration. Future empirical research using more deductive approaches will be needed to test the validity of the process model abductively developed here.

5.3 Future research

The two-stage process model of AL has identified several topics for future research. First, the impact of entrepreneurial identity on loss aversion. Entrepreneurial identity is fluid and can change during the entrepreneurial process (Mathias and Williams 2017). Entrepreneurs can also simultaneously assume multiple identities (Jain et al. 2009). How do entrepreneurial identities influence loss aversion? For example, are individuals who identify themselves with the heroic image of entrepreneurs less loss averse compared to individuals who do not? How does this relationship change over time? Will identity over time have a diminishing effect on loss aversion?

Second, the influence of affect on willingness. Research shows that affect influences experts differently than it does novices (Hsu and Price 1993), and that experts self-regulate their emotions (Lopes et al. 2005). How does affect influence the willingness component of AL in experts as opposed to novices? In addition, information on opportunity influences the judgments and investment decisions made by entrepreneurs (Finucane et al. 2000). How the information is presented may increase the impact it has on decisions (Slovic et al. 2000). Entrepreneurs see information that is related to their feelings (Baron 2008). In addition, individuals are subject to psychological numbing (Fetherstonhaugh et al. 1997), which is the effect wherein individuals are less able to value differences in quantities far removed from zero (Slovic et al. 2004). Given that AL is closer to zero, are entrepreneurs more or less prone to numbing and more attuned to value differences?

Third, entrepreneurial investment decisions are multistage processes (McCann and Folta 2012) and

investments take place in stages. Entrepreneurs seldom make one large investment, but divide their willingness into several (smaller) investments. What are the mechanisms of AL when multiple investment decisions are taken into consideration? How does the evaluation of an investment influence the next one? Myopic loss aversion (Benartzi and Thaler 1995) provides a fruitful lens to study this topic.

Fourth, both the data collected here and prior research (e.g., Fischer and Reuber 2011) show that entrepreneurs invest nonmonetary resources, such as social and psychological ones (Daniel et al. 2014). Future research can examine how exactly the process model of AL works with such nonmonetary investments.

Fifth, different types of resources are substitutable—for example, human and financial capital. Entrepreneurs' opportunity confidence (Davidsson 2015) influences the composition of their resources (Chandler and Hanks 1998). The composition is also influenced by the capital intensity of the industry (Eckhardt et al. 2006) and entrepreneurial self-efficacy (Cassar and Friedman 2009). How do substitutions of resources, opportunity confidence, capital intensity, and self-efficacy influence the process model of AL?

Finally, as suggested by Locke (2001), future research should test the reliability of the modified scale developed in this study.

6 Conclusion

In this study, I set out to deepen our understanding of AL as a heuristic in the arsenal of effectual entrepreneurs. Interviewing entrepreneurs and their early-stage stakeholders revealed interesting connections with key concepts from the psychology of decision-making, both in terms of cognition and affect. The path I have taken leaves us at a crossroads where we need to assess our own abilities and willingness to push the frontier forward in effectuation research. I believe this special issue helps reinforce our identities in this regard so that we can overcome our loss aversion in taking the next step. I welcome all new investments in this intellectual venture.

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Appendix

Table 3 Selection criteria and applicable cases

	BudgetCo	GameCo	MusicCo	PaymentCo	PostCo	SecurityCo	TransactionCo
Entrepreneurs face uncertainty	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Entrepreneurs face resource constraints	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Expert and novice entrepreneurs	Expert: four cofounders ranging between 1 and 3 venture experiences	Intermediate: one founder with 7 years of venture experience (second venture)	Novice: two cofounders, one still in university; the other graduated 2 years before, both with 1 venture experience	Intermediate: one founder with several years of venture experience (second venture)	Intermediate: one founder with several years of venture experience (second venture)	Novice: one founder with only a few years of venture experience (first venture)	Intermediate: two cofounders, both with 14 years of venture experience (first venture)
Introduced innovative or noninnovative products	New market innovation	No innovation	New product innovation	New product innovation	New product innovation	New market innovation	New product innovation
The use of the affordable loss principle	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Solo and team entrepreneurs	Team	Solo	Team	Team	Solo	Solo	Team
Different stages of entrepreneurial development[a]	Seed	Post-entrepreneurial stage	Start-up	Seed	Seed	Early growth	Post-entrepreneurial stage

[a] Robert's (1991) three phases of entrepreneurial development

Table 4 Case descriptions

BudgetCo: The idea for a mobile platform that helps users make more informed decisions regarding purchases to manage their budgets came to the founder of BudgetCo in 2012. After developing an initial concept of the idea, the founder approached three close friends to be part of the founding team, and the product concept also expanded to include mobile payments. In 2014, the group came to the conclusion that a large investment was required to make the mobile app a reality. The group decided to venture with another project with the aspiration of raising the capital required.

GameCo: With the introduction of the iPad in 2010, the creator of GameCo started development of an iPad game. With the support of outsourced iOS developers, the game was launched in Apple's App Store in 2011. Despite being launched on the market, GameCo did not meet the expectations of the creator and was not successful. For this reason, the creator started working in 2011 with a different outsourced software developer with the intention to relaunch.

MusicCo: In February 2012, two friends cofounded an online music-streaming service. The beta version of MusicCo was launched on October 1, 2013. The launch did not proceed without challenges, most of which were due to finding software developers. In its 2 years of existence, MusicCo collected more than 20,000 songs in its database. MusicCo's founders plan to open the platform to the public, index their content in the Google search engine, and also introduce a mobile version of the service.

PaymentCo: The idea for a new mobile and online payment solution came to the founder of PaymentCo in 2008, but it was not until 2012 that he started designing and developing the product. The product was mainly designed by the founder, and he used one person to test for bugs. A patent has been applied for and granted, and at the moment, the founder is pitching his product to banks with the hope of going live in 2015. The vision is to position this product as the main online and mobile payment solution in the world.

PostCo: In 2007, PostCo was developed based on personal experience in a post office. It is a system that sends notifications via SMS to mobile phones or emails to users' inboxes. A working prototype was developed and a patent has been granted. However, the product has not been further developed since 2009 nor was it introduced to the market because a postal multinational company introduced a competing product.

SecurityCo: The founder of SecurityCo started in 2009 by serendipity. As he was repurposing the use of storage area networks as data storage for large companies, such as banks and casinos, he was overwhelmed with the request for these systems for security purposes. In 2010, he completed his first major project for security. However, mainly due to failing to create a sustainable competitive advantage, SecurityCo was leapfrogged by its competitors. As of 2015, SecurityCo is developing new products with its international partners.

TransactionCo: In 2000, TransactionCo was funded as a consultant's bureau for the banking industry. With their experience in this industry, the two cofounders pitched a new automated transaction-processing system that became the flagship product of TransactionCo. Over the years, Transaction Co. has grown, and the company mostly has international clients. It has added additional features and functionalities and released two additional automated transaction-processing systems for other sectors.

Table 5 Overview of the empirical measurement indicators

Authors (year of publication)	Indicators
Chandler et al. (2007)	Three items on a five-point Likert scale: 1. We were careful not to commit more resources than we could afford to lose. 2. We were careful not to risk more money than we were willing to lose with our initial idea. 3. We were careful not to risk so much money that the company would be in real trouble financially if things did not work out.
Garonne and Davidsson (2010)	Follows Chandler et al. (2007)
Chandler et al. (2011)	Follows Chandler et al. (2007)
Murnieks, Haynie, Wiltbank, and Harting (2011)	Two items on a five-point Likert scale: 1. Predictions of trends and demand in this market are: a. Useful to create forecasts of what your business might accomplish. b. Misleading, as they do not incorporate the impact of your firm. 2. In situations like this, it is important to base strategy on: a. Forecasts of customer demand. b. What you are capable of.
Newbert (2012)	Dummy variable: coded 1 for respondents having defined financial projections; coded 0 otherwise Have financial projections such as income or cash flow statements or break-even analyses been developed, will financial projections be developed in the future, or is this not relevant for the new business?

Table 5 (continued)

Authors (year of publication)	Indicators
Fisher (2012)	Qualitative study Coding adapted from Chandler et al. (2011): 1. Commits only limited amounts of resources to the venture at a time: a. Seeks out ways of doing things in inexpensive ways. 2. Limits the resources committed to the venture into what could be lost: a. Develops product or service using only personal resources.
Brettel et al. (2012)	Five items on a six-point Likert scale: 1. Considerations about potential losses were decisive for the selection of the R&D option. 2. Project budgets were approved on the basis of considerations about acceptable losses. 3. The selection of the R&D option was mostly based on a minimization of risks and costs. 4. We mainly considered the potential risk of the project: a. We compared different R&D options on the basis of an assessment of risks and costs that we were willing to lose (e.g., due to a lack of possibilities to make concise forecasts of expected returns). b. We did hardly perform systematic analyses of external parameters; we rather decided intuitively. 5. Decisions on capital expenditures were primarily based on potential risks of losses.
Evald and Senderovitz (2013)	Qualitative study. Coding used is: Whether the three owner-managers reason that it is valuable for them to predict the future, or if they are disregarding the necessity to do so, and, in this respect, whether the firms are trying to prioritize (and maximize) the expected returns or prioritize "affordable losses."
Daniel et al. (2014)	Qualitative study. Coding used is: 1. Benefits of online businesses: a. Can work anywhere or anytime. b. Initial cost limited. c. Can start small. 2. Benefits of working from home: a. Can work around other responsibilities. b. Freedom to work how, when, and wherever. 3. Family involvement: a. Spouse attitude, support, or involvement. b. Children or plans for children in the future c. Other family involvement.
Engel et al. (2014)	Follows Murnieks, Haynie, Wiltbank, and Harting (2011)
Reymen et al. (2015)	Qualitative study. Coding used is: 1. Being willing to make affordable personal sacrifices (including nonmonetary ones) for the best of the venture. 2. Finding unused resources in local environment (including subsidies). 3. Investing limited, small amounts of personal/company money, time, and effort. 4. Managing growth expectations and ambitions. 5. Limiting stakeholders' commitments to levels that are uncritical to them.
George et al. (2015)	Two items on a five-point Likert scale: Authors asked each: 1. Household head if their current household income allowed for savings. 2. Respondents how much they were able to save.
Werhahn et al. (2015)	Study 1: Eight items, agree/disagree statements: 1. Only invest in what we can afford to lose. 2. Only undertake those measures, for which our company is able to provide the necessary capacities (i.e., capital, time, competencies, and so on.). 3. Only invest if the loss of the investment would not ruin the company. 4. Are not willing to make profitable investments if these will jeopardize the stability of our company. 5. Only invest if we can afford to lose the total amount of the investment sum. 6. Try to limit the potential loss of initiatives to an acceptable degree. 7. Stop execution of plans early if we can see that more investments (i.e., of capital, time, competencies, and so on) will be necessary, but are not justifiable. 8. Consider the worst-case scenario as an important risk-management tool for any decisions. Study 2: Three items, agree/disagree statements

Table 5 (continued)

Authors (year of publication)	Indicators
	1. Only invest in what we can afford to lose. 2. Only invest if the loss of the investment would not ruin the company. 3. Try to limit the potential loss of initiatives to an acceptable degree.
Smolka et al. (2016)	Adapted from Chandler et al. (2011): 1. I was careful not to commit more resources than I could afford to lose. 2. I was careful not to risk more money than I was willing to lose with my initial idea. 3. I was careful not to risk so much money that the company would be in real trouble financially if the things did not work out.
Cai et al. (2016)	Follows Chandler et al. (2011): 1. We are careful not to commit more resources than we could afford to lose. 2. We are careful not to risk more money than we were willing to lose with our initial idea. 3. We are careful not to risk so much money that the company would be in real trouble financially if things did not work out.
Guo et al. (2016)	Follows Chandler et al. (2011)
Parida et al. (2016)	Follows Chandler et al. (2011)
Roach et al. (2016)	Adapted from Chandler et al. (2011), Brettel et al. (2012), and Read et al. (2009): 1. We tend to not commit more resources than we can afford to lose, even if the potential for return is significant. 2. We are careful not to risk more money than we are willing to lose, even if our concept is very appealing. 3. We are careful not to exceed the company's financial capacity should our innovation project prove to be unsuccessful.

References

Abeler, J., Falk, A., Goette, L., & Huffman, D. (2011). Reference points and effort provision. *American Economic Review, 101*(2), 470–492.

Alsos, G. A., Clausen, T. H., Hytti, U., & Solvoll, S. (2016). Entrepreneurs' social identity and the preference of causal and effectual behaviours in start-up processes. *Entrepreneurship and Regional Development, 28*(3-4), 234–258.

Arkes, H. R., Joyner, C. A., Pezzo, M. V., Nash, J. G., Siegel-Jacobs, K., & Stone, E. (1994). The psychology of windfall gains. *Organizational Behavior and Human Decision Processes, 59*(3), 331–347.

Auken, H. V. (2005). Differences in the usage of bootstrap financing among technology-based versus nontechnology-based firms. *Journal of Small Business Management, 43*(1), 93–103.

Baker, T., & Nelson, R. E. (2005). Creating something from nothing: resource construction through entrepreneurial bricolage. *Administrative Science Quarterly, 50*(3), 329–366.

Barberis, N., & Huang, M. (2001). Mental accounting, loss aversion, and individual stock returns. *The Journal of Finance*. https://doi.org/10.1111/0022-1082.00367.

Baron, R. A. (2008). The role of affect in the entrepreneurial process. *Academy of Management Review*. https://doi.org/10.5465/AMR.2008.31193166.

Baron, R. A., & Henry, R. A. (2010). How entrepreneurs acquire the capacity to excel: insights from research on expert performance. *Strategic Entrepreneurship Journal*. https://doi.org/10.1002/sej.82.

Benartzi, S., & Thaler, R. H. (1995). Myopic loss aversion and the equity premium puzzle. *The Quarterly Journal of Economics*. https://doi.org/10.2307/2118511.

Berends, H., Jelinek, M., Reymen, I. M. M. J., & Stultiëns, R. (2014). Product innovation processes in small firms: combining entrepreneurial effectuation and managerial causation. *Journal of Product Innovation Management*. https://doi.org/10.1111/jpim.12117.

Bhide, A. (1992). Bootstrap finance: the art of start-ups. *Harvard Business Review, 70*(6), 109–117.

Blanchflower, D. G., & Oswald, A. J. (1998). What makes an entrepreneur? *Journal of Labor Economics*. https://doi.org/10.1086/209881.

Bradley, S., McMullen, J., Atmadja, A., Simiyu, E., & Artz, K. (2011). Self-employed or employing others? Pre-entry capabilities, entrepreneurial action, and the learned resourcefulness of microcredit firm founders. *Frontiers of Entrepreneurship Research, 31*(19), Article 2.

Brettel, M., Mauer, R., Engelen, A., & Küpper, D. (2012). Corporate effectuation: entrepreneurial action and its impact on R&D project performance. *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2011.01.001.

Brush, C. G. (2008). Pioneering strategies for entrepreneurial success. *Business Horizons*. https://doi.org/10.1016/j.bushor.2007.09.001.

Burmeister, K., & Schade, C. (2007). Are entrepreneurs' decisions more biased? An experimental investigation of the susceptibility to status quo bias. *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2006.04.002.

Cai, L., Runping, G., Fei, Y., & Liu, Z. (2016). Effectuation, exploratory learning and new venture performance: evidence from China. *Journal of Small Business Management*. https://doi.org/10.1111/jsbm.12247.

Carter, R. B., & Van Auken, H. (2005). Bootstrap financing and owners' perceptions of their business constraints and opportunities. *Entrepreneurship and Regional Development*. https://doi.org/10.1080/08985620500067548.

Carver, C. S. (2006). Approach, avoidance, and the self-regulation of affect and action. *Motivation and Emotion*. https://doi.org/10.1007/s11031-006-9044-7.

Cassar, G., & Friedman, H. (2009). Does self-efficacy affect entrepreneurial investment? *Strategic Entrepreneurship Journal*. https://doi.org/10.1002/sej.73.

Chandler, G. N., & Hanks, S. H. (1998). An examination of the substitutability of founders human and financial capital in emerging business ventures. *Journal of Business Venturing*. https://doi.org/10.1016/S0883-9026(97)00034-7.

Chandler, G. N., DeTienne, D. R., & Mumford, T. V. (2007). Causation and effectuation: measurement development and validation. *Frontiers of Entrepreneurship Research, 27*(13), Article 3.

Chandler, G. N., DeTienne, D. R., McKelvie, A., & Mumford, T. V. (2011). Causation and effectuation processes: a validation study. *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2009.10.006.

Chenail, R. J. (2011). Interviewing the investigator: Strategies for addressing instrumentation and researcher bias concerns in qualitative research. *The Qualitative Report, 16*(1), 255–262.

Chrisman, J. J., & Patel, P. C. (2012). Variations in R&D investments of family and nonfamily firms: behavioral agency and myopic loss aversion perspectives. *Academy of Management Journal*. https://doi.org/10.5465/amj.2011.0211.

Cornelissen, J. (2017). Editor's comments: developing propositions, a process model, or a typology? Addressing the challenges of writing theory without a boilerplate. *Academy of Management Review*. https://doi.org/10.5465/amr.2016.0196.

Curtis, S., Gesler, W., Smith, S., & Washburn, S. (2000). Approaches to sampling and case selection in qualitative research: examples in the geography of health. *Social Science & Medicine*. https://doi.org/10.1016/S0277-9536(99)00350-0.

Daniel, E. M., Domenico, M. D., & Sharma, S. (2014). Effectuation and home-based online business entrepreneurs. *International Small Business Journal*. https://doi.org/10.1177/0266242614534281.

Darvin, R., & Norton, B. (2015). Identity and a model of investment in applied linguistics. *Annual Review of Applied Linguistics*. https://doi.org/10.1017/S0267190514000191.

Davidsson, P. (2015). Entrepreneurial opportunities and the entrepreneurship nexus: a re-conceptualization. *Journal of Business Venturing* https://doi.org/10.1016/j.jbusvent.2015.01.002.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2009a). Effectual versus predictive logics in entrepreneurial decision-making: differences between experts and novices. *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2008.02.002.

Dew, N., Sarasvathy, S. D., Read, S., & Wiltbank, R. (2009b). Affordable loss: behavioral economic aspects of the plunge decision. *Strategic Entrepreneurship Journal*. https://doi.org/10.1002/sej.66.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2010). On the entrepreneurial genesis of new markets: effectual transformations versus causal search and selection. *Journal of Evolutionary Economics*. https://doi.org/10.1007/s00191-010-0185-1.

Dew, N., Read, S., Sarasvathy, S. D., & Wiltbank, R. (2015). Entrepreneurial expertise and the use of control. *Journal of Business Venturing Insights*. https://doi.org/10.1016/J.JBVI.2015.09.001.

Di Domenico, M., Haugh, H., & Tracey, P. (2010). Social bricolage: theorizing social value creation in social enterprises. *Entrepreneurship Theory and Practice*. https://doi.org/10.1111/j.1540-6520.2010.00370.x.

Drnovsek, M., Cardon, M. S., & Patel, P. C. (2016). Direct and indirect effects of passion on growing technology ventures. *Strategic Entrepreneurship Journal*. https://doi.org/10.1002/sej.1213.

Duncan, R. B. (1972). Characteristics of organizational environments and perceived environmental uncertainty. *Administrative Science Quarterly* http://www.jstor.org/stable/2392145.

Ebben, J. J. (2009). Bootstrapping and the financial condition of small firms. *International Journal of Entrepreneurial Behavior & Research*. https://doi.org/10.1108/13552550910967930.

Eccles, J. (1983). Expectancies, values, and academic behaviors. In J. T. Spence (Ed.), *Achievement and achievement motives: psychological and sociological approaches* (pp. 75–146). San Francisco, CA: W. H. Freeman.

Eckhardt, J. T., Shane, S., & Delmar, F. (2006). Multistage selection and the financing of new ventures. *Management Science*. https://doi.org/10.1287/mnsc.1050.0478.

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*. https://doi.org/10.5465/AMR.1989.4308385.

Eisenhardt, K. M., & Graebner, M. E. (2007). Theory building from cases: opportunities and challenges. *Academy of Management Journal*. https://doi.org/10.5465/AMJ.2007.24160888.

Engel, Y., Dimitrova, N. G., Khapova, S. N., & Elfring, T. (2014). Uncertain but able: entrepreneurial self-efficacy and novices' use of expert decision-logic under uncertainty. *Journal of Business Venturing Insights*. https://doi.org/10.1016/j.jbvi.2014.09.002.

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*. https://doi.org/10.1037/0033-295X.100.3.363.

Estrin, S., Mickiewicz, T., & Rebmann, A. (2017). Prospect theory and the effects of bankruptcy laws on entrepreneurial aspirations. *Small Business Economics*. https://doi.org/10.1007/s11187-016-9810-1.

Evald, M. J., & Senderovitz, M. (2013). Exploring internal corporate venturing in SMEs: effectuation at work in a new context. *Journal of Enterprising Culture*. https://doi.org/10.1142/S021849581350012X.

Fetherstonhaugh, D., Slovic, P., Johnson, S., & Friedrich, J. (1997). Insensitivity to the value of human life: a study of psychophysical numbing. *Journal of Risk and Uncertainty*. https://doi.org/10.1023/A:1007744326393.

Finucane, M. L., Alhakami, A., & Slovic, P. (2000). The affect heuristic in judgments of risks and benefits. *Journal of Behavioral Decision Making, 12*(1), 1–17.

Fischer, E., & Reuber, A. R. (2011). Social interaction via new social media: (how) can interactions on Twitter affect effectual thinking and behavior? *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2010.09.002.

Fisher, G. (2012). Effectuation, causation, and bricolage: a behavioral comparison of emerging theories in entrepreneurship research. *Entrepreneurship Theory and Practice*. https://doi.org/10.1111/j.1540-6520.2012.00537.x.

Fisher, G., & Aguinis, H. (2017). Using theory elaboration to make theoretical advancements. *Organizational Research Methods, 20*(3), 438–464.

Folta, T. B., Delmar, F., & Wennberg, K. (2010). Hybrid entrepreneurship. *Management Science*. https://doi.org/10.1287/mnsc.1090.1094.

Foo, M. (2011). Emotions and entrepreneurial opportunity evaluation. *Entrepreneurship Theory and Practice*. https://doi.org/10.1111/j.1540-6520.2009.00357.x.

Garonne, C., & Davidsson, P. (2010). Do strategy choices matter for nascent firms? Effectuation in the early stages of venture creation. *2010 Academy of Management Annual Meeting Proceedings*. Academy of Management. http://eprints.qut.edu.au/39692/1/c39692.pdf. **Accessed 18 July 2018**.

Garud, R., & Karnøe, P. (2003). Bricolage versus breakthrough: distributed and embedded agency in technology entrepreneurship. *Research Policy*. https://doi.org/10.1016/S0048-7333(02)00100-2.

Gatewood, E. J., Shaver, K. G., Powers, J. B., & Gartner, W. B. (2002). Entrepreneurial expectancy, task effort, and performance. *Entrepreneurship Theory and Practice*. https://doi.org/10.1111/1540-8520.00006.

van Gelderen, M., Sayers, S., & Keen, C. (2013). Home-based internet businesses as drivers of variety. *Journal of Small Business and Enterprise Development*. https://doi.org/10.1108/14626000810850900.

Gendron, M., & Barrett, L. F. (2009). Reconstructing the past: a century of ideas about emotion in psychology. *Emotion Review*. https://doi.org/10.1177/1754073909338877.

van Gennep, A. (2013). *The rites of passage*. London: Routledge.

George, G. (2005). Slack resources and the performance of privately held firms. *Academy of Management Journal*. https://doi.org/10.5465/AMJ.2005.17843944.

George, G., Kotha, R., Parikh, P., Alnuaimi, T., & Bahaj, A. S. (2015). Social structure, reasonable gain, and entrepreneurship in Africa. *Strategic Management Journal*. https://doi.org/10.1002/smj.2381.

Grichnik, D., Brinckmann, J., Singh, L., & Manigart, S. (2014). Beyond environmental scarcity: human and social capital as driving forces of bootstrapping activities. *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2013.02.006.

Grinblatt, M., & Han, B. (2005). Prospect theory, mental accounting, and momentum. *Journal of Financial Economics*. https://doi.org/10.1016/j.jfineco.2004.10.006.

Guo, R., Cai, L., & Zhang, W. (2016). Effectuation and causation in new internet venture growth. *Internet Research*. https://doi.org/10.1108/IntR-01-2015-0003.

Haynie, J. M., Shepherd, D., Mosakowski, E., & Christopher, E. P. (2010). A situated metacognitive model of the entrepreneurial mindset. *Journal of Business Venturing*. https://doi.org/10.1016/J.JBUSVENT.2008.10.001.

Hoang, H., & Gimeno, J. (2010). Becoming a founder: how founder role identity affects entrepreneurial transitions and persistence in founding. *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2008.07.002.

Hsu, M., & Price, V. (1993). Political expertise and affect. *Communication Research*. https://doi.org/10.1177/009365093020005003.

Hsu, D. K., Wiklund, J., & Cotton, R. D. (2017). Success, failure, and entrepreneurial reentry: an experimental assessment of the veracity of self-efficacy and prospect theory. *Entrepreneurship Theory and Practice*. https://doi.org/10.1111/etap.12166.

Jain, S., George, G., & Maltarich, M. (2009). Academics or entrepreneurs? Investigating role identity modification of university scientists involved in commercialization activity. *Research Policy*. https://doi.org/10.1016/J.RESPOL.2009.02.007.

Johnson, E. J., Gaechter, S., & Herrmann, A. (2006). Exploring the nature of loss aversion. *SSRN* eLibrary, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=892336. **Accessed 17 July 2018**.

Kahneman, D., & Tversky, A. (1979). Prospect theory: an analysis of decision under risk. *Econometrica, 47*(2), 263–292.

Ketokivi, M., & Choi, T. (2014). Renaissance of case research as a scientific method. *Journal of Operations Management, 32*(5), 232–240.

Koudstaal, M., Sloof, R., & Praag, M. v. (2016). Risk, uncertainty, and entrepreneurship: evidence from a lab-in-the-field experiment. *Management Science*. https://doi.org/10.1287/mnsc.2015.2249.

Krueger, N. F. (2007). What lies beneath? The experiential essence of entrepreneurial thinking. *Entrepreneurship Theory and Practice*. https://doi.org/10.1111/j.1540-6520.2007.00166.x.

Lahm, R. J., Jr., & Little, H. T., Jr. (2005). Bootstrapping business start-ups: entrepreneurship literature, textbooks, and teaching practices versus current business practices? *Journal of Entrepreneurship Education, 8*, 61–73.

Lipshitz, R., & Strauss, O. (1997). Coping with uncertainty: a naturalistic decision-making analysis. *Organizational Behavior and Human Decision Processes*. https://doi.org/10.1006/obhd.1997.2679.

Locke, K. (2001). *Grounded theory in management research*. London: Sage.

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: a 35-year odyssey. *American Psychologist*. https://doi.org/10.1037/0003-066X.57.9.705.

Loewenstein, G. (2000). Emotions in economic theory and economic behavior. *The American Economic Review, 90*(2), 426–432.

Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*. https://doi.org/10.1037/0033-2909.127.2.267.

Lopes, P. N., Salovey, P., Côté, S., & Beers, M. (2005). Emotion regulation abilities and the quality of social interaction. *Emotion*. https://doi.org/10.1037/1528-3542.5.1.113.

Martina, R. A. (2016). *Uncertainty and resource constraints in the Small Island Developing States: essays in entrepreneurial cognition*. Maastricht, Netherlands: Boekenplan.

Mathias, B. D., & Williams, D. W. (2017). The impact of role identities on entrepreneurs' evaluation and selection of opportunities. *Journal of Management*. https://doi.org/10.1177/0149206314544747.

McCann, B. T., & Folta, T. B. (2012). Entrepreneurial entry thresholds. *Journal of Economic Behavior & Organization*. https://doi.org/10.1016/j.jebo.2012.09.020.

Miles, M., & Huberman, A. (1994). *Qualitative data analysis*. London: Sage.

Mitchell, J. R., Smith, J. B., Gustafsson, V., Davidsson, P., & Mitchell, R. K. (2005). *Thinking about thinking about thinking: exploring how entrepreneurial metacognition affects entrepreneurial expertise. Presented at: The Babson Research Conference, June 10, 2005*. Wellesley, MA: Babson College.

Morgan, J., & Sisak, D. (2016). Aspiring to succeed: a model of entrepreneurship and fear of failure. *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2015.09.002.

Murnieks, C., & Mosakowski, E. (2007). Who am I? Looking inside the 'entrepreneurial identity.'. *Frontiers of Entrepreneurship Research, 27*(5), Article 5.

Murnieks, C. Y., Haynie, J. M., Wiltbank, R. E., & Harting, T. (2011). I like how you think: similarities as an interaction bias in the investor-entrepreneur dyad. *Journal of Management Studies, 48*, 1533–1561.

Navis, C., & Glynn, M. A. (2010). How new market categories emerge: temporal dynamics of legitimacy, identity, and entrepreneurship in satelite radio, 1990-2005. *Administrative Science Quarterly*. https://doi.org/10.2189/asqu.2010.55.3.439.

Newbert, S. L. (2012). Marketing amid the uncertainty of the social sector: do social entrepreneurs follow best marketing practices? *Journal of Public Policy & Marketing*. https://doi.org/10.1509/jppm.11.038.

Parida, V., George, N. M., Lahti, T., & Wincent, J. (2016). Influence of subjective interpretation, causation, and effectuation on initial venture sale. *Journal of Business Research, 69*(11), 4815–4819.

Perry, J. T., Chandler, G. N., & Markova, G. (2012). Entrepreneurial effectuation: a review and suggestions for future research. *Entrepreneurship Theory and Practice*. https://doi.org/10.1111/j.1540-6520.2010.00435.x.

Peters, E., Slovic, P., & Hibbard, J. (2004). Evaluability manipulations influence the construction of choices among health plans (Report No. 04–02). *Eugene, OR: Decision Research*.

Peters, E., Lipkus, I., & Diefenbach, M. A. (2006). The functions of affect in health communications and in the construction of health preferences. *Journal of Communication*. https://doi.org/10.1111/j.1460-2466.2006.00287.x.

Petrova, K. (2012). Part-time entrepreneurship and financial constraints: evidence from the Panel Study of Entrepreneurial

Dynamics. *Small Business Economics*. https://doi.org/10.1007/s11187-010-9310-7.

Pollock, T. G., & Lashley, K. (2014). Who needs a shrink when you have businessweek? Using content analysis to get inside the heads of entrepreneurs, VCs and other market participants. In T. Baker & F. Welter (Eds.), *The Routledge companion to entrepreneurship* (pp. 423–438). New York: Routledge.

Powell, E. E., & Baker, T. (2014). Creating slack: institutional constraints and entrepreneurial discretion. *Frontiers of Entrepreneurship Research, 34*(14), Article 1.

Prelec, D., & Loewenstein, G. (1998). The red and the black: mental accounting of savings and debt. *Marketing Science*. https://doi.org/10.1287/mksc.17.1.4.

Read, S., Song, M., & Smit, W. (2009). A meta-analytic review of effectuation and venture performance. *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2008.02.005.

Reymen, I. M. M. J., Andries, P., Berends, H., Mauer, R., Stephan, U., & Burg, E. v. (2015). Understanding dynamics of strategic decision making in venture creation: a process study of effectuation and causation. *Strategic Entrepreneurship Journal*. https://doi.org/10.1002/sej.1201.

Reymen, I. M. M. J., Berends, H., Oudehand, R., & Stultiëns, R. (2017). Decision making for business model development: a process study of effectuation and causation in new technology-based ventures. *R&D Management*. https://doi.org/10.1111/radm.12249.

Roach, D. C., Ryman, J. A., & Makani, J. (2016). Effectuation, innovation and performance in SMEs: an empirical study. *European Journal of Innovation Management*. https://doi.org/10.1108/EJIM-12-2014-0119.

Sarasvathy, S. D. (2001). Causation and effectuation: toward a theoretical shift from economic inevitability to entrepreneurial contingency. *Academy of Management Review*. https://doi.org/10.5465/AMR.2001.4378020.

Sarasvathy, S. D. (2008). *Effectuation: elements of entrepreneurial expertise*. Cheltenham: Edward Elgar Publishing Limited.

Sarasvathy, S. D. (2015). The downside of entrepreneurial opportunities. *M@n@gemen, 17*(4), 305–315.

Sarasvathy, S. D., & Dew, N. (2003). Effectual networks: a pre-commitment approach to bridging the gap between opportunism and trust. Presented at: *Academy of Management Annual Meeting in Seattle*.

Sarasvathy, S. D., & Dew, N. (2005). New market creation through transformation. *Journal of Evolutionary Economics*. https://doi.org/10.1007/s00191-005-0264-x.

Sinclair, M., & Ashkanasy, N. M. (2005). Intuition. *Management Learning*. https://doi.org/10.1177/1350507605055351.

Slovic, P., Monahan, J., & MacGregor, D. G. (2000). Violence risk assessment and risk communication: the effects of using actual cases, providing instruction, and employing probability versus frequency formats. *Law and Human Behavior*. https://doi.org/10.1023/A:1005595519944.

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). Risk as analysis and risk as feelings: some thoughts about affect, reason, risk, and rationality. *Risk Analysis*. https://doi.org/10.1111/j.0272-4332.2004.00433.x.

Slovic, P., Peters, E., Finucane, M. L., & MacGregor, D. G. (2005). Affect, risk, and decision making. *Health Psychology*. https://doi.org/10.1037/0278-6133.24.4.S35.

Smolka, K. M., Verheul, I., Burmeister-Lamp, K., & Heugens, P. P. M. A. R. (2016). Get it together! Synergistic effects of causal and effectual decision-making logics on venture performance. *Entrepreneurship Theory and Practice*. https://doi.org/10.1111/etap.12266.

Soman, D. (2001). The mental accounting of sunk time costs: why time is not like money. *Journal of Behavioral Decision Making*. https://doi.org/10.1002/bdm.370.

Steffens, P. R., Baker, T., & Senyard, J. M. (2010). Betting on the underdog: bricolage as an engine of resource advantage. Proceedings of Annual Meeting of the Academy of Management 2010. Academy of Management.

Stryker, S., & Burke, P. J. (2000). The past, present, and future of an identity theory. *Social Psychology Quarterly*. https://doi.org/10.2307/2695840.

Thaler, R. H. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior & Organization*. https://doi.org/10.1016/0167-2681(80)90051-7.

Thaler, R. H. (1999). Mental accounting matters. *Journal of Behavioral Decision Making, 12*(3), 183–206.

Timmermans, S., & Tavory, I. (2012). Theory construction in qualitative research: from grounded theory to abductive analysis. *Sociological Theory, 30*(3), 167–186.

Turner, V. W. (1974). Liminal to liminoid in play, flow, and ritual: an essay in comparative symbology. *Rice University Studies, 60*(3), 53–92.

Tversky, A., & Kahneman, D. (1974). The framing of decisions and the psychology of choice. *Science*. https://doi.org/10.1126/science.185.4157.1124.

Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: a reference-dependent model. *The Quarterly Journal of Economics*. https://doi.org/10.2307/2937956.

Weick, K. E. (1969). *The social psychology of organizing*. London: Addison-Wesley Publishing Company.

Welter, F., & Smallbone, D. (2003). Entrepreneurship and enterprise strategies in transition economies: an institutional perspective. In D. A. Kirby & A. Watson (Eds.), *Developed and transition economies: a reader (transition and development)* (pp. 95–114). Hampshire: Ashgate Publishing Limited.

Welter, F., & Xheneti, M. (2013). Reenacting contextual boundaries—entrepreneurial resourcefulness in challenging environments. In A. C. Corbett & J. A. Katz (Eds.), *Entrepreneurial resourcefulness: competing with constraints (advances in entrepreneurship, firm emergence and growth, volume 15)* (pp. 149–183). Bingley: Emerald Group Publishing Limited.

Wennberg, K., Delmar, F., & McKelvie, A. (2016). Variable risk preferences in new firm growth and survival. *Journal of Business Venturing*. https://doi.org/10.1016/j.jbusvent.2016.05.001.

Werhahn, D., Mauer, R., Flatten, T. C., & Brettel, M. (2015). Validating effectual orientation as strategic direction in the corporate context. *European Management Journal*. https://doi.org/10.1016/j.emj.2015.03.002.

West, G. P. (2007). Collective cognition: when entrepreneurial teams, not individuals, make decisions. *Entrepreneurship Theory and Practice*. https://doi.org/10.1111/j.1540-6520.2007.00164.x.

Wiklund, J., & Shepherd, D. (2003). Knowledge-based resources, entrepreneurial orientation, and the performance of small and

medium-sized businesses. *Strategic Management Journal*. https://doi.org/10.1002/smj.360.

Wiltbank, R., Dew, N., Read, S., & Sarasvathy, S. D. (2006). What to do next? The case for non-predictive strategy. *Strategic Management Journal*. https://doi.org/10.1002/smj.555.

Winborg, J. (2009). Use of financial bootstrapping in new businesses: a question of last resort? *Venture Capital*. https://doi.org/10.1080/13691060802351248.

Winborg, J., & Landström, H. (2001). Financial bootstrapping in small businesses. *Journal of Business Venturing*. https://doi.org/10.1016/S0883-9026(99)00055-5.

Wu, B., & Knott, A. M. (2006). Entrepreneurial risk and market entry. *Management Science*. https://doi.org/10.1287/mnsc.1050.0543.

Ye, Q. (2011). The role of affect in multiple processes of entrepreneurial decision making (INTERACTIVE PAPER). *Frontiers of Entrepreneurship Research, 31*(5), Article 15.

Yin, R. K. (2009). *Case study research: design and methods* (4th ed.). Thousand Oaks: Sage Publications.